



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,853	08/17/2006	Takeshi Kihara	295159U/S8X PCT	3549
22850 7590 03/22/2010 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER AKRAM, IMRAN				
ART UNIT 1795		PAPER NUMBER		
NOTIFICATION DATE 03/22/2010		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdoCKET@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary

Application No.

10/589,853

Applicant(s)

KIHARA ET AL.

Examiner

IMRAN AKRAM

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 30 and 31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 30 and 31 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 2/5/10 have been fully considered but they are not persuasive. The Kawamura '784 reference still applies, albeit in different form as necessitated by amendment.
2. Applicant asserts in paragraph 2 of page 6 of the Arguments that the Kawamura '784 reference discloses a catalyst layer **13** provided on the groove **12**. Applicant alleges that Kawamura '784 therefore does not teach a catalyst supported independent of wall surfaces. Kawamura '784, however, discloses multiple embodiments. The sixth and eighth embodiments, in which the configuration of the catalyst is different than the embodiment Applicant describes, anticipate the present claims as shown in the rejection below.
3. Applicant's arguments with respect to claims 5 and 6 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment. Kawamura '859 now modifies the base reference Kawamura '784 in a combination not yet addressed.
4. Applicant's arguments with respect to claim 31 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment. The Bowe reference now anticipates the claim, obviating the arguments directed towards the combination of Bowe with the Kawamura '784 reference.

Claim Objections

5. Claims 5 and 6 are objected to because of the following informalities: Claim 5 recites "with a heater at at least one of said first or second substrates." It is unclear what is meant by the heater being at at least one of the substrates. Claim 6 depends on objected claim 5. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 30 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 30 requires that the metal base body be circular in section. However, claim 1 on which it depends requires that only one substrate have a microchannel portion formed thereon. Given the wire shape of the catalyst carrying member, and in light of what is provided in the specification, it is not conveyed how to construct a configuration in which only one substrate has a channel formed on it, the catalyst carrying member is wire shaped, and the metal base body is circular in section.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by the eighth embodiment of Kawamura '784 (US 2004/0025784 A1).

10. Regarding claim 1, Kawamura '784 discloses a first substrate **11** and a second substrate **14** that are joined together (see figure 16); a flow path **20** formed by a microchannel groove **39** formed on the surface of the second substrate **14** (see figure 16); and a catalyst **49** disposed in the flow path but on the wall surface of the first substrate **11** and independent of the microchannel groove **39** (paragraph 105). The catalyst is disposed on a catalyst carrying member (paragraph 42) and is wire shaped (see figure 1).

11. Regarding claim 2, Kawamura '784 discloses that said catalyst carrying member comprises a metal base body, a metal oxide film covering said metal base body, and said catalyst supported on said metal oxide film (paragraph 42).

12. Regarding claims 3 and 4, these claims are read as product-by-process claims. As the product is anticipated, the process by which the product is made is not given patentable weight.

13. Regarding claim 5, Kawamura '784 discloses providing a heater **17** on the second substrate **14** (see figure 16).

14. Claims 1 and 7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by the sixth embodiment of Kawamura '784.

15. Regarding claim 1, Kawamura '784 discloses a first substrate **11** and a second substrate **14** that are joined together (see figure 14); a flow path **20** formed by a microchannel groove **39** formed on the surface of the second substrate **14** (see figure 14); and a catalyst **48** disposed supported on a catalyst carrying member (paragraph 42) and therefore independent of the microchannel groove **39**. The catalyst carrying member is wire shaped (see figure 1).

16. Regarding claim 7, Kawamura '784 discloses that said catalyst carrying member comprises an electric heater **17**, a metal oxide film **48** covering said electric heater (see figure 14), and a catalyst supported on said metal oxide film (paragraph 42).

17. Regarding claim 8, this claim is read as a product-by-process claim. As the product is anticipated, the process by which the product is made is not given patentable weight.

18. Regarding claim 9, Kawamura '784 discloses that said catalyst carrying member comprises an electric heater **17**, a metal film **48** covering said electric heater, a metal oxide film covering said metal film (see figure 14), and a catalyst supported on said metal oxide film (paragraph 42).

19. Regarding claims 10 and 11, these claims are read as product-by-process claims. As the product is anticipated, the process by which the product is made is not given patentable weight.

20. Claims 1, 2, and 30 are rejected under 35 U.S.C. 102(a) as being anticipated by Yagi (WO/2004/069738). Corresponding application US 2006/0051260 A1 will be used for translation and citation purposes.

21. Yagi discloses a first substrate **142** and a second substrate **144** joined together (see figure 17); a microchannel portion **143** formed on the first substrate **142** and a microchannel portion **145** formed on the second substrate **144**, forming a flow path **146** between the substrates; a catalyst **C** supported on a catalyst carrying member metal oxide film **147** and therefore independent of microchannel wall support (paragraph 141). The catalyst carrying member is circular in section (see figure 17).

22. Claim 31 is rejected under 35 U.S.C. 102(a) as being anticipated by Bowe (US 2003/0105172 A1).

23. Bowe discloses multiples substrates **42** joined together; a groove microchannel **44** formed in the substrates to create flow path (paragraph 40); a catalyst carrying member metal base body **46** that comprises a metal oxide film covering the base body (paragraph 42) and a catalyst supported on the film (paragraph 42). The catalyst is supported independent of the microchannel walls (paragraph 42). The metal body is wavelike in section (see figure 4).

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

25. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

26. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

27. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over either the sixth or eighth embodiment of Kawamura '784 as applied to claim 1 above, and further in view of Kawamura '859 (US 2004/0148859 A1).

28. Kawamura '784 does not disclose a heater provided on an insulating layer. Kawamura '859—in an invention for a similar plate reactor—discloses a first substrate **12** with a microchannel **14** and a second substrate **18** with a heater **23** disposed via an insulating layer **25** on the side opposite the microchannel (see figure 15). This heater/insulation layer increases thermal efficiency (paragraph 127). It would have been obvious to one having ordinary skill in the art at the time of invention to add the heater of Kawamura '859 to the second substrate of Kawamura '784 in the heat insulating layer **57** to heat the substrate and reactants in a thermally efficient manner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IMRAN AKRAM whose telephone number is (571)270-3241. The examiner can normally be reached on 10-7 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/I. A./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795